mill

A mill is a machine that applies power to perform various types of work: grinding, crushing, stamping, and pressing. The term mill also refers to the building that houses such a machine. For many centuries, most mechanical work was performed by WATERWHEELS and windmills, and thus the word mill eventually became a synonym for any workplace where machinery was used. The term milling is now used to describe a large number of processes performed by MACHINE TOOLS.

The earliest mills were hand-powered devices for grinding grain, such as the quern, in which an upper grinding stone with a handle is rotated inside a nether stone containing the grain. Although humanpower continued to be used to turn treadmills, draft animals soon began to provide the power for the larger grinding and pressing mills. The watermill, powered by a horizontal wheel, was probably first used in the West by the Greeks. The first efficient waterwheel, however, was a Roman invention. The Roman wheel, which was vertical, used a sophisticated system of gearing to transmit the motion of the waterwheel to a grinding stone that moved on a horizontal plane; by changing the diameter of the gear wheels, the speed of the stone's rotation could be changed.

From the Roman era and for well over a millennium waterwheels were the major source of mill power in Europe. Efficient windmills were a later development, achieving their greatest use only after the 15th century. Windmill technology grew increasingly complex, and windmills were used not only for grinding but also to saw wood, ventilate mines, and pump water. The Dutch were the acknowledged masters of windmill design and construction, and Dutch millwrights were sought as expert engineers, especially on large projects such as the draining of marshes, where windmills powered the pumps.

In 1784, London's large flour millers, the Albion Mills, began to use steam power for their milling. Within the following century the steam engine transformed the landscape of Europe as the thousands of windmills and waterwheels that had provided most of the continent's power gradually fell into disuse and were dismantled. (In the first half of the 19th century, for example, more than 9,000 windmills were in use in the Netherlands. By 1900 this number had shrunk to 2,000. The 1,000 mills that remain today are preserved primarily as historical monuments.)

The new steam-powered factories, with their machines and machine tenders, were totally unlike the older workplaces, but old language habits persisted, and they too were called "mills." (For a discussion of the contemporary rediscovery of windpower as an economic energy source, see WINDMILLS AND WINDPOWER).

Carol Mankin

Bibliography: Arbiter, Nathaniel, ed., Milling Methods in the Americas (1964); Bennett, Richard, and Elton, John, History of Corn Milling, 4 vols. (1904; repr. 1964); Kuhlman, Charles B., Development of the Flour Milling Industry in the United States (1929; repr. 1968); Rizzo, Leo, Milling Machines Explained (1984); Steen, Herman, Flour Milling in America (1963; repr. 1973); Zimilies, Murray, and Knigin, Michael, Early American Mills (1973).